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ABSTRACT

The experiment was designed to test the effects of covert behavior upon the verbal expression of emotional words contained in a TAT-like story. Subjects were 63 college students. The first independent variable, "self-regulation," consisted of three levels: (a) a no self-monitoring condition, (b) a self-monitoring condition, and (c) a self-monitoring with self-evaluation condition. The second independent variable, visual imagery, involved the administration of positive, neutral, or aversive images contingent upon an actual or perceived increase in the target response. The data were analyzed using a 3x3 factorial design in a multivariate analysis of covariance and a repeated measures analysis of covariance. No significant differences were found on the major hypotheses, but a remarkable trend in the interaction graphs stimulates a number of specific suggestions to further researchers. (Author)

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THE EFFECT OF THE COVERT BEHAVIORS OF VISUAL IMAGERY, SELF-MONITORING, AND SELF-EVALUATION UPON THE OVERT EXPRESSION OF EMOTIONAL WORDS

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Abstract

The experiment was designed to test the effects of covert behavior upon the verbal expression of emotional words contained in a TAT-like story. The first independent variable, "self-regulation," consisted of three levels: (a) a no self-monitoring condition, (b) a self-monitoring condition, and (c) a self-monitoring with self-evaluation condition. The second independent variable, visual imagery, involved the administration of positive, neutral, or aversive images contingent upon an actual or perceived increase in the target response. The data were analyzed using a 3x3 factorial design in a mutivariate analysis of covariance and a repeated measures analysis of covariance. No significant differences were found on the major hypotheses, but a remarkable trend in the interaction graphs stimulates a number of specific suggestions to further researchers.

THE EFFECT OF THE COVERT BEHAVIORS OF VISUAL IMAGERY, SELF-MONITORING AND SELF-EVALUATION UPON THE OVERT EXPRESSION OF EMOTINAL WORDS

Attention to the area of self-regulation of behavior has increased dramatically over the past several years. One model describing the process of self-regulation was proposed by Kanfer (1971). His ideas suggest that there are three necessary steps involved in the regulation of a person's behavior. First, a behavioral observation or self-monitoring phase occurs. This is followed by a self-evaluation stage in which the observed behavior is compared to a predetermined criteria. Finally, depending on the judgment made in the self-evaluation, a positive or negative self-reinforcement (which could be delivered in the form of a positive or negative self-verbalization or image) is presented. The type of self-reinforcement delivered will effect the future probabilities of the self-regulated response. In summary, self-regulation is a process of self-monitoring, self-evaluation, and self-reinforcing.

Clinical work on self-regulation has led Cautela (1967; 1970a; 1970b; 1971a; 1971b; 1972) to formulate a number of covert imagery procedures which can be viewed as directly analogous to the third portion of Kanfer's general model (i.e., self-reinforcement). Cautela's counseling treatment programs employ self-reinforcing and self-punishing visual imagery to increase or decrease the likelihood of certain desired or undesired behavior.

The basic assumption of Cautela's approach is that a reinforcing or punishing stimulus, when presented in imagination, will function in a manner essentially similar to an externally applied stimulus.

This study employed an overtly observable criterion variable: the number of emotional words (Ullmann & McFarland, 1957) verbalized in a TAT-like story generated in response to a collection of cartoon pictures. The purpose of the experiment was to attempt to influence the number of emitted emotional words by manipulation of certain covert behaviors drawn from Kaufer's model (1971) of self-regulation and Cautela's (1971a; 1972) theories of covert reinforcement (Cautela, 1970a) and covert sensitization (Cautela, 1967).

If Kanfer's model was appropriate, subjects in a group receiving instructions to both self-monitor (SM) and self-evaluate (SE) should have emitted more emotional words in telling their stories than those who were asked only to self-monitor. Likewise, a SM - only group should have outperformed a no-self-monitoring (NSM) control condition.

Positive, aversive and neutral visual images were developed and, presentation was made contingent upon an actual or perceived increase in the number of emotional words expressed in one story as compared to the immediately preceding story. Given this contingency, the positive imagery condition should have served to increase the occurrence of the target behavior while the aversive condition should have decreased the target behavior's frequency (Cautela, 1971a; 1972). Those subjects exposed to a neutral imagery condition were expected to be little influenced by the contingent administration of that particular covert behavior.

Method

Subjects

Sixty-three volunteer subjects were solicited in the Spring term, 1973, from upper level and graduate courses in the Colleges of Education and Human Ecology at Michigan State University. The subjects knew only that the experiment would take an hour and a half and that it would be primarily verbal in nature. Each subject was randomly assigned to one of nine treatment conditions.

Instruments

The study employed two types of dependent measures. First, the concomitant variable (covariate) was a self-evaluation of empathic ability. Second, a set of fifteen measurements was collected reflecting the number of emotional words emitted for each subject on the fifteen cartoon-stimulated stories.

The self-evaluation of empathic ability questionnaire was based on a self-esteem inventory developed by Coopersmith (1959). The modified version employed by this study contained thirty-eight items covering a wide variety of empathy-related characteristics. Items appeared in the form of self-descriptive sentences, such as, "I am a person who is comfortable with emotions," and "It's difficult for me to speak about feelings." The respondent checked agreement or disagreement with each statement on a 6-point Likert scale, ranging from "very strongly agree" to "very strongly disagree." The scoring of the questionnaire involved a summation of the weights assigned to each of the subject's responses.

Since the self-evaluation questionnaire had been developed for this study, there is no existing predictive or concurrent validity evidence

available. Content validity was checked by a group of experienced counselors prior to the printing of the forms. An internal-consistency reliability of the instrument for the subjects in this study was estimated by Hoyt's (1941) analysis of variance procedure yielding a reliability of .91 and a standard error of measurement equal to 4.98.

The ratings of the number of emotional words emitted during the stories produced the major dependent variables of the investigation. The definition of the words which would be counted as "emotional" words followed the outline given by Ullmann& McFarland (1957). Comments and exclamations to the experimenter during the time alloted for telling each story were included in the word count along with the purely story-oriented verbalizations.

The question of validity is essentially irrelevant to this variable since no argument is made that the variable, in and of itself, is meaningful. In some ways, emotional words can clearly be viewed as analogous to counseling related behaviors, but this was not much more than an interesting coincidence. The behavior of emitting emotional words was chosen primarily on the basis that it was relatively easily observable and that it should have been relatively easily influenced by experimental manipulations.

Inter-rater reliability for individual ratings on post-experimental ratings of emotional words yielded analysis of variance estimates (Ebel, 1951) of .910. The standard error of measurement was 2.14.

Procedure

Subjects received the treatment individually. They were informed upon arrival that most of the instructions would be presented on audiotape and that the experimenter would sit behind them to avoid distracting them from their concentration.

After completing the empathy perception questionnaire and a demographic

data form, subjects were presented with a stack of fifteen randomly-ordered cartoon picture cards (e.g., children eating a cake; a man fishing; a woman bird watching). After a thirty second thinking-organizing period on each card, the subject was asked to tell a two and one quarter minute story involving something about the past, present, and future of the scene pictured in the cartoons.

Subjects knew that each story was being recorded. Additionally, they were intentionally misinformed that the attribute of empathy was being tested and that it could "be expressed through one's use of appropriate feelings and emotion-laden words." This brief statement was intended to key subjects to the behavior of particular interest in the study without explaining any part of the actual experimental manipulations.

Until the completion of the first story, all subjects had received identical treatment conditions. Thus, the number of emotional words expressed in response to the first picture provided an appropriate second covariate for the data analysis. Those who naturally tend to employ emotional words were expected to continue to do so throughout the experiment.

Following the initial story, the independent variables were introduced according to each subject's particular experimental condition. The 3x3 factorial design with repeated measures created nine experimental cells with seven subjects in each cell. The first independent variable of interest, self-regulation, had three levels. The self-monitoring and self-evaluation checklists after each story. These forms asked subjects to estimate their production of emotional words (SM) and to evaluate whether they felt they had increased, decreased or remained about the same as in the immediately preceding story (SE). The second level of the self-regulation variable,

self-monitoring (SM), only involved the checklist regarding estimation of emotional words after each scory. The third level, no-self-monitoring (NSM), received no forms or checklists after each story.

The imagery variable also had three levels: positive, (e.g. a very pleasant mountain scene), aversive (e.g., crawling insects and vomit), and neutral (e.g., a piece of chalk). Each subject received only one general type of image and these were presented as randomized scenes written on 5"x8" cards. A subject was asked to read and picture the specific scences described on an imagery card for thirty seconds only after an actual or perceived increase (from one rating to the next) in the number of emotional words expressed. The satisfaction of this contingency was decided by an experimenter tally in both the NSM and SM conditions. In the SMSE group, however, the subject determined, based upon the self-evaluation checklist, whether the contingency had been met.

An experimenter was present in the room throughout the study to request, when appropriate to the contingencies or to the experimental condition, that the subject (a) read and imagine the scene presented on an imagery card, (b) stop imagining a scene after 30 seconds, and (c) take and complete a self-monitoring a self-evaluation form.

Statistical Analysis

There were two major analyses performed on these data. The first, a multivariate analysis of covariance (MANOVA), employed the number of emotional words in the first story and a self-perception of empathic ability questionnaire as covariates with the ratings of emotional words in the remaining fourteen stories as the dependent variables. The second analysis,

a repeated measures analysis of covariance (ANCOVA), employed the basic design (3x3) with the addition of the emotional word ratings for stories 2-15 as the repeated measures dimension.

Results

There was a significant relationship between the covariate measures and the dependent variables. The F-value for the test of no association between the 14 dependent variables (the emotional words in stories 2 through 15) and the two covariates (self-perceived empathy and emotional words in story 1) was 2.81. With degrees of freedom 28 and 78, this result indicated a relationship which could occur by chance alone only two times out of ten thousand. The high degree of relationship between the covariates and dependent variables indicated that the MANCOVA and the repeated measures analysis with covariance would increase the precision of the test over that of a straight analysis of variance.

Table 1 contains a summary of the two data analyses. Neither analysis yielded significant differences on the self-regulation and visual imagery variables nor on the interaction between these independent variables and the repeated measures variable. Hence, no support for the major hypotheses of the study was found.

Insert Table 1 About Here

Despite the lack of support of the hypothesized differences between the self-regulation conditions and between the three imagery categories, the importance of these question argues for the inclusion of the interaction means (Figures 1 and 2). The graphic presentation, although <u>not</u> representing any significant differences, indicates some trends in the direction of the

hypotheses. For example, no mean of the NSM group, with the exception of the mean at the time of the second story, was ever as large as the corresponding mean in the SMSE condition. Also, there are only two cases among the fourteen stories where the means of the SM condition exceeded the SMSE group. It must be stressed that these tendencies were not statistically significant.

Insert Figures 1 and 2 about here

The graphic presentation of the imagery conditions indicates similar non-significant tendencies. No mean of the aversive subjects was as high as the corresponding mean of either the neutral or of the positive group. Also, in only one case after the fifth story (allowing some time for the images to begin to have an effect) was the positive group exceeded by the neutral condition.

Returning once again to Table 1, it can be noted that the only significant difference obtained was on the measures variable in the repeated measures analysis of covariance ($p<.0338$). Omega squared ($\hat{\omega}^2$), a measure of the proportion of variance accounted for, indicated that 9% of the variance was attributable to the measures effect. (For a discussion of $\hat{\omega}^2$, see Kirk, 1968, p.127.) The significant finding, here, was unrelated to the major hypotheses of the study. The differences between measures must be the result of a time effect since the cartoon stimuli were randomly presented, and any one cartoon was unlikely to be presented at the same time (or story position) for one subject as for another. The means for each story position are reported in Table 2.

Insert Table 2 about here

Discussion

The basic orientation of this discussion is a direct product of the examination of the treatment interaction curves for the self-regulation condition and the imagery variables (Figures 1 and 2, respectively). Neither graph pictures a significant effect for either treatment or for the treatment interaction with measures, but, as noted earlier, both demonstrate remarkably consistent trends.

Perhaps, even the consistencies that are present would be disregarded, were they not precisely in the directions predicted by the hypotheses of the study. These non-significant tendencies in the data generate interesting material for speculation and discussion. Thus, the basic orientation of the following comments is that these graphs do present promising indications despite a lack of statistical support.

There are several possible sources which might have helped to create the non-significant results obtained in this study. First of all, the theoretical foundation may be invalid. Kanfer's (1971) model and Cautela's covert imagery techniques (1971a; 1972) may be inaccurate. The data trends, as weak as they are, would not support this view, and more substantial counterarguments are found in the accumulating literature, both clinical and empirical, which supports these theories.

A second possible hypothesis leading to a lack of significance is related to the experimental instructions. Perhaps, the indication that the study was a test of empathy and that the number of emotional words would indicate one's empathic ability created a "ceiling effect"

on the criterion variable. Since "empathy" is a highly valued attribute, all subjects might have immediately hit their "ceiling" in the number of emotional words expressed and stayed nearly at that level thereafter (no matter what the treatment condition). Those slight trends of Figures 1 and 2 could, perhaps, signify the relatively weak treatment effects masked by the stronger phenomena of a ceiling effect. On the other hand, the strong correlation between emotional words on story one and the emotional words emitted on all fourteen additional stories tends to argue against the existence of such a "ceiling." Future research must take care to select a dependent variable that will not likely have upper limits.

As a third hypothesis, it may be that subjects who were assigned to either the self-monitoring or self-evaluation conditions did not, in fact, specifically try to carry out the procedures requested on each checklist. There was support for this idea in the follow-up checks on the subjects' ratings which were found inconsistent with what was actually rated by the experimenter. Further studies must define more clearly the self-monitoring operation by more directly asking subjects to count behaviors as they occur.

Fourth, the subjects may have not had a sufficiently exact working definition of an emotional word. Since none was provided, subjects could have been trying to increase "emotional words" that were not considered as "emotional words" by the experimenter tally. A clear definition of the behavior desired might be a great improvement for additional research in self-monitoring and self-evaluation.

Fifth, the question of subject commitment or motivation needs to

be considered as a possible cause of the indecisive results. As had been mentioned earlier, the only significant result in Table 1 was the time effect. (The means for this effect are found in Table 2.) Across all stories, the number of emotional words in the first few stories tended to increase to a maximum at the sixth story. From this point, the means of emotional words seemed to decline until the twelfth story where, again, they increased until the final story. Such indications may relfect the subjects' motivation which is high at the start, "wears" in the middle, and picks up close to the end. Future studies may wish to employ a concealment of the length of the session and of the number of repeated tasks (e.g., cartoon cards).

As a final possible explanation, particularly for the imagery effects, the experiment did not incorporate initial deep muscle relaxation, individualized images, and concentrated practicing of these images. These points have been stressed by Cautela (1972) in his clinical applications of covert techniques. Such clinical procedures could be incorporated into future studies to increase the likelihood of the reinforcing (or punishing) aspects of the visual imagery.

In summary, despite the absence of significant findings relative to the major dimensions of the study, the present investigation has generated a number of hypotheses which may serve to further the investigation of the area of covert behavior. Among the specific suggestions offered to future researchers are (a) select a dependent variable which is not likely to be so easily influenced as to produce a "ceiling effect," (b) make the definition of the dependent variable operationally clear to the subjects, (c) attempt to make sure that subject motivation and

concentration remain high during the study, (d) in the self-regulation dimension, tell the subjects what self-monitoring involves and influence them to actually record their behavior, and (e) relative to the imagery variable, incorporate a procedure to allow for relaxation, for individualization of imaginal scenes, and for practice of the process of forming visual images.

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Table 1

Summary of the Multivariate Analysis of Covariance and the Repeated Measures Analysis of Covariance on Fourteen Observations of the Number of Emitted Emotional Words

A. MANCOVA (3 levels of self-regulation X 3 levels of imagery with 2 covariates* and 14 measures)

Source	Multivariate d.f.	Multivariate F	P less Than
Mode of Self-Regulation (SR)	28,78	.643	.9052
Imagery (I)	28,78	.853	.6745
SR x I	56,153.86	.846	.7614

F Value for test of hypothesis of no association between dependent and independent variables = 2.8109 D.F. = 28,78 $p < .0002$

B. Repeated Measures ANCOVA (3 levels of self-regulation X 3 levels of imagery X 14 repeated measures with 2 covariates)

Source	d.f.	$d.f._{adj.}$	$SS_{adj.}$	$MS_{adj.}$	F	P Less Than
Mode of Self-Regulation (SR)	2	2	95.13	47.57	1.589	.2139
Imagery (I)	2	2	28.70	14.35	.479	.6219
SR X I	4	4	109.05	27.26	.911	.4648
Replications (R) Within SR X I	54	52	1556.88	29.94		
Measures (M)	13	13	1371.59	105.51	2.438	.0338**
SR X M	26	26	790.74	30.41	.787	.9213**
I X M	26	26	1074.73	43.34	.952	.6273**
SR X I X M	52	52	1998.46	38.43	.887	.7850**
Error (R X M: SR X I)	702	700	30455.62	43.38		

$\hat{\omega}^2$ for measures is .09

F Value for test of hypothesis of no association between dependent and independent variables = 32.84 D.F. = 2,52 $p < .0001$

*Covariates employed were: 1. the number of emotional words emitted in the first story
2. the self-perception of empathic ability questionnaire

**Probabilities based on an exact test of repeated measures effects.

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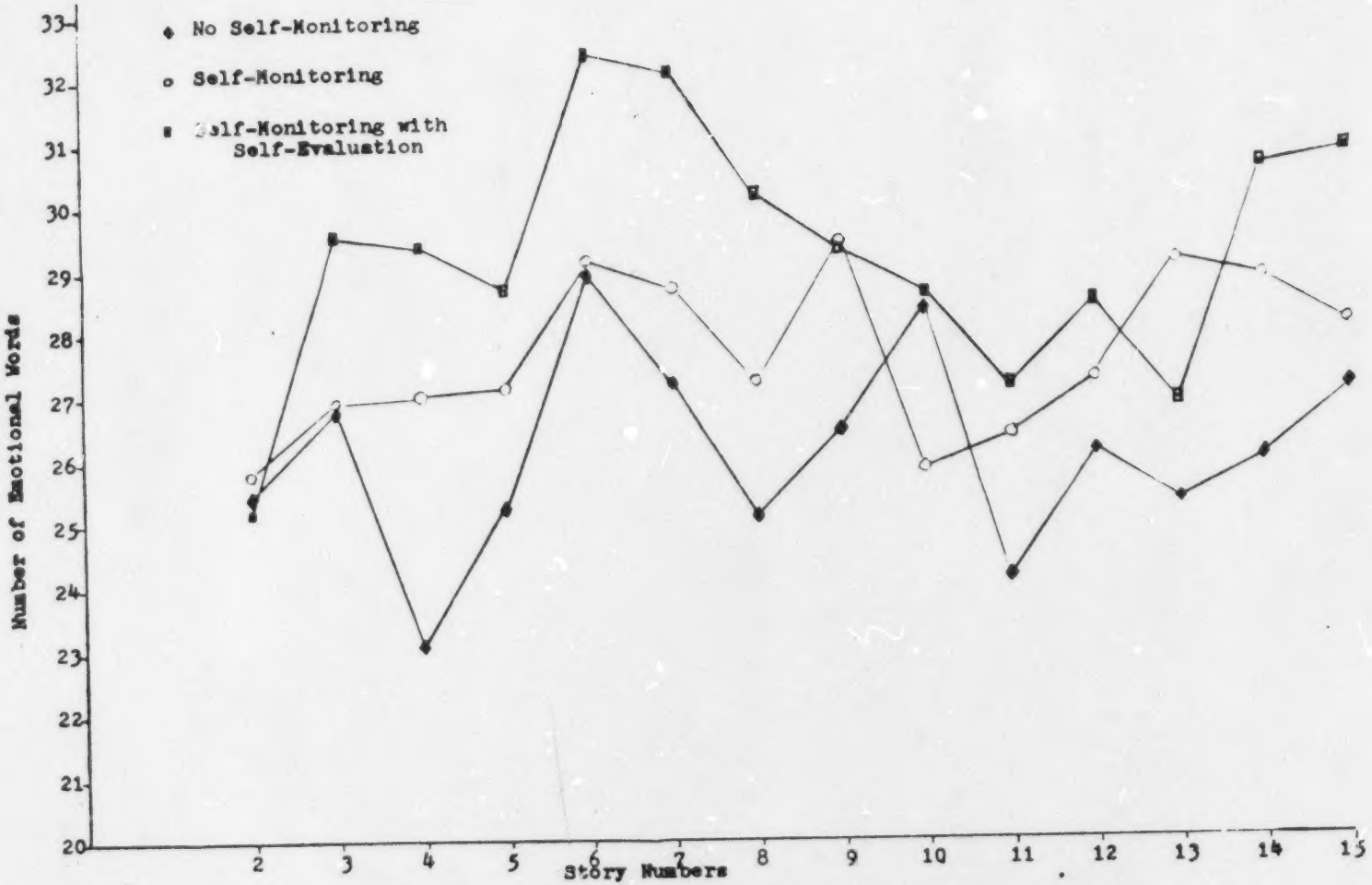

Fig. 1 Graphical presentation of mean numbers of emotional words for each story for each self-regulation condition.

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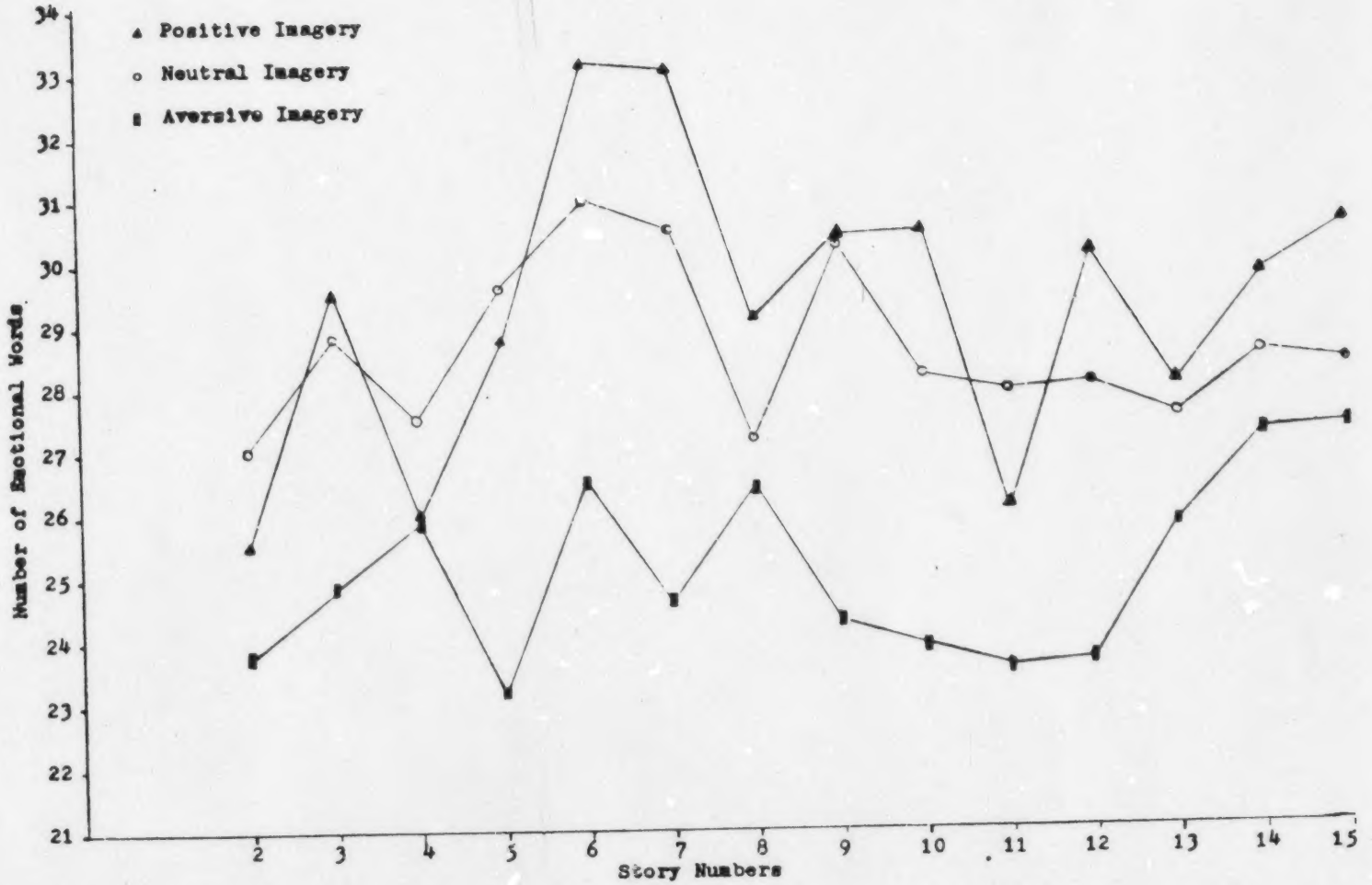

Fig. 2. Graphical presentation of mean numbers of emotional words for each story for each imagery condition.

Table 2
Mean Number of Emotional Words Emitted
for Each Story Position

Story Position	Mean	Story Position	Mean
2	25.46	9	28.45
3	27.74	10	27.64
4	26.51	11	25.89
5	27.18	12	27.29
6	30.18	13	27.14
7	29.37	14	28.51
8	27.56	15	28.76